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[Intervention Review]

Interventions for asymptomatic retinal breaks and lattice degeneration for preventing retinal detachment

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ABSTRACT

Background

Asymptomatic retinal breaks and lattice degeneration are visible lesions that are risk factors for later retinal detachment. Retinal detachments occur when fluid in the vitreous cavity passes through tears or holes in the retina and separates the retina from the underlying retinal pigment epithelium. Creation of an adhesion surrounding retinal breaks and lattice degeneration, with laser photocoagulation or cryotherapy, has been recommended as an effective means of preventing retinal detachment. This therapy is of value in the management of retinal tears associated with the symptoms of flashes and floaters and persistent vitreous traction upon the retina in the region of the retinal break, because such symptomatic retinal tears are associated with a high rate of progression to retinal detachment. Retinal tears and holes unassociated with acute symptoms and lattice degeneration are significantly less likely to be the sites of retinal breaks that are responsible for later retinal detachment. Nevertheless, treatment of these lesions frequently is recommended, in spite of the fact that the effectiveness of this therapy is unproven.

Objectives

The objective of this review was to assess the effectiveness and safety of techniques used to treat asymptomatic retinal breaks and lattice degeneration for the prevention of retinal detachment.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (2014, Issue 2), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to February 2014), EMBASE (January 1980 to February 2014), PubMed (January 1948 to February 2014), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictip/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 19 February 2014. Textbooks regarding retinal detachment and the reference lists of relevant reports were reviewed for additional study reports. We contacted experts in the field for details of other published and unpublished studies.

Selection criteria

This review was designed to include randomized controlled trials in which one treatment for asymptomatic retinal breaks and lattice degeneration was compared with another treatment or no treatment.

Data collection and analysis

Initially, one author assessed the search results and collected relevant studies. Since no studies met the inclusion criteria, no studies were assessed for risk of bias. No data were extracted and no meta-analysis could be performed.

Main results

No trials were found that met the inclusion criteria for this review.

Authors' conclusions

No conclusions could be reached about the effectiveness of surgical interventions to prevent retinal detachment in eyes with asymptomatic retinal breaks or lattice degeneration, or both. Current recommendations for treatment, based upon a consensus of expert opinion, should be assessed in a randomized controlled trial.

PLAIN LANGUAGE SUMMARY

Interventions for asymptomatic retinal breaks and lattice degeneration for preventing retinal detachment

Review question

We reviewed the evidence about whether treatment of retinal breaks (holes or tears in the retina) and retinal lattice degeneration (thinning and atrophy of retinal tissue) can prevent retinal detachment, a serious vision-threatening problem.

Background

The retina is composed of membranous layers at the back of the eye. It is the part of the eye that converts visual images into information interpreted by the brain as vision. Sometimes, retinal tissue can tear (known as retinal breaks). The effects of the tearing may cause visual disturbances such as dark floaters or flashing lights. When retinal breaks develop without symptoms, they are termed asymptomatic. Retinal lattice degeneration is a condition associated with retinal breaks in which the retinal tissue breaks down or thins in a lattice pattern.

When a retinal break occurs, fluid from the eye may leak between layers of the retina, specifically between the sensory retina and the retinal pigment epithelium, and cause separation. This separation is known as retinal detachment. Because retinal breaks and lattice degeneration are associated with retinal detachment, treatment of these conditions has been proposed as a way to prevent retinal detachment. Laser therapy or cryotherapy (freezing), or both, are often used with the goal of eliminating the fluid and space between retinal layers.

Results

The author of this review discovered no relevant studies. There is no evidence to demonstrate the effectiveness of prophylactic therapy for asymptomatic tears or holes in the retina. The evidence is current to February 2014.

BACKGROUND

Description of the condition

A retinal detachment is a separation of the sensory retina from the retinal pigment epithelium, with an accumulation of fluid in the potential space between them. Retinal detachments can be rhegmatogenous (caused by a break in the retina) or non-rhegmatogenous (caused by leakage from beneath the retina or by traction (pulling) on the retina). This review is concerned with the prophylactic treatment of the asymptomatic retinal breaks and areas of degeneration that might cause rhegmatogenous retinal detachment. Other Cochrane systematic reviews evaluating surgical treatments for rhegmatogenous retinal detachments are in preparation (Ramchand 2010; Znaor 2012).

A break in the retina can be categorized as a tear or a hole. The break may be associated with symptoms or may be asymptomatic. Acute retinal breaks associated with the sudden onset of symptoms of dark floaters or flashing lights, or both, are a common cause of retinal detachment. Asymptomatic retinal breaks are much more common but much less likely to lead to retinal detachment. Therefore most retinal breaks do not lead to retinal detachment.

Lattice degeneration is a vitreoretinal disorder characterized by focal lesions which are associated with asymptomatic retinal holes and an increased likelihood of future retinal tears. Because asymptomatic retinal breaks and lattice degeneration are visible, common, and associated with retinal detachment, they have frequently been considered for prophylactic therapy.

Non-traumatic, phakic retinal detachments occur in approximately 1/10,000 persons/year (Haimann 1982; Wilkes 1982). The incidence is slightly greater if traumatic cases are included, but approximately 1% to 2% of patients who undergo cataract surgery will ultimately develop a retinal detachment (Rowe 1999; Tielsch 1996). Myopia is a major risk factor for retinal detachment, and there is a direct relationship between the amount of myopia and the chances of detachment (EDCSG 1993). The chances of retinal detachment are greater in the second eye of a person who has had a retinal detachment in one eye (AAO 2003).

Lattice degeneration is present in 6% to 8% of the general population and in approximately 30% of phakic retinal detachments (Byer 1992). The chances of a retinal detachment developing in an eye with lattice degeneration were less than 1% over an average of 11 years if retinal detachment had not occurred in the other eye (Byer 1989). In people with lattice degeneration in both eyes and a history of detachment in the first eye, the incidence of detachment in the second eye over seven years was between 2% to 5% (Folk 1989).

Asymptomatic retinal breaks are present in approximately 6% of eyes in both clinical and autopsy studies (Wilkinson 1997). The chances of retinal detachment due to an asymptomatic retinal break in people in which a retinal detachment has not occurred in either eye were approximately 0.5% over a follow-up period averaging 11 years (Byer 1998). If a retinal detachment has occurred in one eye of a person with an asymptomatic retinal break in the second eye, the chances of retinal detachment in the latter eye appear to be higher, with incidence figures ranging from 0% to 15% (Wilkinson 1997). However, data regarding such cases are incomplete, and the relationship between the asymptomatic

breaks, new retinal breaks, and retinal detachment remains unclear.

Asymptomatic retinal breaks frequently are observed within the lesions of lattice degeneration. These are usually small atrophic holes; retinal detachments due to these breaks are usually slowly progressive and are most frequent in myopic eyes of patients less than 60 years of age.

Asymptomatic retinal breaks and lattice degeneration are usually diagnosed during routine evaluations of the peripheral retina following dilatation of the pupil. The lesions are usually present at the equator of the retina or more anteriorly, and the technique of scleral depression may be required for pathology to be visualized.

Description of the intervention

Asymptomatic retinal breaks and lattice degeneration are usually treated with transconjunctival cryotherapy or laser photocoagulation, or both. With cryotherapy, a probe shaped like a pen whose tip is cooled to very low temperatures is applied on the conjunctiva to freeze the retina through the outer layers of the eyeball. With laser photocoagulation, a high-energy beam is delivered through the ocular media to the affected area.

How the intervention might work

With either technique, a thermal burn is created to surround the lesion and any subretinal fluid associated with it. The burn becomes an adhesion between the retina and retinal pigment epithelium to limit potential flow of fluid from the vitreous cavity through an asymptomatic break, retinal hole associated with lattice degeneration, or retinal break that occurs later at a site of lattice degeneration.

Why it is important to do this review

An evidence-based approach to the practice of medicine has become more important in the face of increasing pressures to maintain quality care in the context of significant cost containment. In making a decision to treat vitreoretinal lesions that are relatively unlikely to cause retinal detachment, the risks that treatment will be unnecessary, ineffective, or even harmful must be weighed against the possible benefit of reducing the rate of subsequent retinal detachment. Therefore, a systematic review of the literature is indicated in an effort to evaluate the effectiveness of prophylactic therapy of asymptomatic retinal breaks and lattice degeneration.

This Cochrane review was preceded by a review of the literature for the production of an updated American Academy of Ophthalmology Preferred Practice Pattern (AAO 2003; Wilkinson 2000). For this Cochrane review, the searches have been extended to include articles from non-English literature and to concentrate on the discovery of randomized controlled trials. The current review is the updated version of previously published Cochrane reviews (Wilkinson 2001; Wilkinson 2005; Wilkinson 2012).

OBJECTIVES

The objective of this review was to assess the effectiveness and safety of techniques used to treat asymptomatic retinal breaks and lattice degeneration for the prevention of retinal detachment.

METHODS

Criteria for considering studies for this review

Types of studies

This review included randomized controlled trials.

Types of participants

Trials included in this review included people with asymptomatic retinal breaks and lattice degeneration. These were divided into:

- those in whom no retinal detachments had occurred; and
- those in whom a retinal detachment had occurred in one eye and asymptomatic breaks or lattice degeneration, or both, were present in the second (fellow) eye.

Trials in which participants had acute symptoms of floaters and flashes were not included in this review.

Types of interventions

Trials were included in which one treatment of asymptomatic retinal breaks and lattice degeneration was compared to control or to another form of treatment. Treatments included transconjunctival cryotherapy and laser photocoagulation.

Types of outcome measures

Primary outcomes

The primary outcome for comparison of the treatments was the rate of retinal detachment following the intervention at one year after randomization. Retinal detachment was defined using a clinical diagnosis of retinal tear or retinal detachment as specified by included studies. Additional time points of interest for this outcome included six months, two years, and other time points as specified by the included studies.

Secondary outcomes

Secondary outcomes for comparison of the treatments included changes in visual acuity and socioeconomic implications (cost of intervention, morbidity). Loss of visual acuity was defined as a loss of 15 letters or more of visual acuity on an Early Treatment Diabetic Retinopathy Study (ETDRS) chart.

We also included morbidity, reported by patients or by quality of life instruments (such as VFQ-25), as data were available in individual studies. Morbidity due to retinal detachment is significant. Although approximately 95% of cases can be repaired successfully, a majority of these patients lose optimal visual acuity. Loss of visual acuity can lead to a loss of depth perception and difficulties with many tasks. The small percentage of treatment failures can lead to blindness and its expected morbidity.

We planned to report secondary outcomes measured at six months, one year, two years, and other time points reported by individual studies.

Search methods for identification of studies

Electronic searches

The Cochrane Eyes and Vision Group (CEVG) searched CENTRAL (which contains the CEVG Trials Register) (2014, Issue 2), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-

Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to February 2014), EMBASE (January 1980 to February 2014), PubMed (January 1948 to February 2014), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov) and the World Health Organization (WHO) International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictip/search/en). No date or language restrictions were used in the electronic searches for trials. The electronic databases were last searched on 19 February 2014.

See: Appendices for details of search strategies for CENTRAL (Appendix 1), MEDLINE (Appendix 2), EMBASE (Appendix 3), PubMed (Appendix 4), mRCT (Appendix 5), ClinicalTrials.gov (Appendix 6) and the ICTRP (Appendix 7).

Searching other resources

For the original American Academy of Ophthalmology report (AAO 1998), experts in the field were contacted for information on further published and unpublished trials. These experts consisted of members of the American Academy of Ophthalmology Preferred Practice Pattern Retina Panel (including Dennis M. Robertson MD, Michael A. Bloome MD, Emily Y. Chew MD, Louis A. Lobes Jr. MD, David W. Parke II MD, Marco A. Zarbin MD, PhD, Paul P. Lee MD, JD, and Flora Lum MD). In the more recent Academy report (AAO 2003), a similar process was conducted by a different panel (composed of Emily Y. Chew MD, William E. Benson MD, H. Culver Boldt MD, Tom S. Chang MD, Louis A. Lobes MD, Joan W. Miller MD, Timothy G. Murray MD, Marco A. Zarbin MD, PhD, and Leslie Hyman PhD).

Data collection and analysis

Selection of studies

The review author reviewed the titles and the abstracts of all the records identified through the electronic searches. The author assessed records for eligibility and classified each record as 'definitely relevant', 'possibly relevant', or 'definitely not relevant'. The full-text reports were obtained for records assessed as 'definitely relevant' or 'possibly relevant'. The author then assessed the full-text reports and judged whether each report was from a study that met the inclusion criteria. Studies excluded after full-text assessment were documented in the [Characteristics of excluded studies](#) table with reasons for exclusion.

Data extraction and management

If studies had met the inclusion criteria, data extraction forms developed by the Cochrane Eyes and Vision Group would have been used to record data related to study characteristics, characteristics of participants, interventions and comparisons, and outcomes prespecified in the Methods section. All data would have been entered into Review Manager (RevMan 2012). For any missing or unclear information, study investigators would have been contacted; after two weeks, if no response was received, the data would be used as available.

Assessment of risk of bias in included studies

The assessment of sources of systematic bias was planned according to the guidelines in Chapter 8 of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011). The following five parameters were to be considered.

1. Sequence generation and allocation concealment.
2. Masking (blinding) of providers, recipients of care, and outcome assessors.
3. Incomplete outcome data.
4. Selective outcome reporting.
5. Other sources of bias.

Each parameter of trial quality was to be reported as 'low risk of bias', 'high risk of bias', or 'unclear risk of bias' (insufficient information to assess). For any missing or unclear information, study investigators would have been contacted; after two weeks, if no response was received, the data would be used as available.

Measures of treatment effect

Dichotomous outcomes

When data become available, the primary outcome (rate of retinal detachment) will be analyzed as a dichotomous outcome and the estimates of treatment effect expressed as risk ratios (RRs) with 95% confidence intervals (CIs). Change in visual acuity also may be treated as a dichotomous outcome, e.g., loss of 3 or more lines from baseline, as data are available in individual studies. Adverse events typically will be treated as dichotomous outcomes.

Continuous outcomes

Change in visual acuity may be treated as a continuous outcome, as data are available in individual studies. The treatment effect will be expressed as a mean difference (MD) with 95% CIs.

Cost of interventions, quality-of-life scores, and morbidity scales (e.g., discomfort, inflammation, and change in refractive error) also may be treated as continuous outcomes as data are available.

Unit of analysis issues

In future updates of this review, the unit of analysis will be the eye (one eye per participant).

Dealing with missing data

As there is no eligible study in this review, no missing data was encountered. In the future, trial investigators will be contacted when desired data are missing or unclear. If investigators do not respond within two weeks, the data as available from the published report will be used (no data will be imputed).

Assessment of heterogeneity

Since no studies were included, no assessment of heterogeneity was performed. If a sufficient number of studies are included in future updates of this review, clinical and methodological heterogeneity will be assessed by examining potential variations in study design, participants' characteristics, inclusion/exclusion criteria, interventions/comparisons, and primary and secondary outcomes. The proportion of variability across the included studies not due to chance will be quantified using the I^2 statistic, with an I^2 greater than 50% indicating substantial statistical heterogeneity (Higgins 2011).

Assessment of reporting biases

For selective outcome reporting, the outcomes prespecified in protocols or clinical trial registration will be compared with the outcomes in the published report(s) of included studies. The outcomes specified in the Methods section will be compared with the outcomes reported in the Results section in included trials when no protocol or clinical trial registration is available. To assess publication bias when ten or more studies are included in a meta-analysis, the symmetry of a funnel plot will be examined. Study characteristics and other factors that may contribute to asymmetry of the funnel plot also will be examined.

Data synthesis

Meta-analysis was planned to combine the results from included trials when clinical and methodological heterogeneity was assessed as minimal. If substantial heterogeneity was assessed, no meta-analysis was planned, rather results would be provided in a narrative summary. If future updates include fewer than three studies, fixed-effect model will be used; otherwise the random-effects model will be used for analyses.

Subgroup analysis and investigation of heterogeneity

Planned subgroup analysis included separate analysis of eyes with and without a history of retinal detachment in the other eye.

Sensitivity analysis

Sensitivity analysis was not conducted due to no studies being included. Planned sensitivity analysis aimed to determine the impact of excluding studies with unclear or high risk of bias due to failure to conceal the allocation before randomization and high risk of reporting bias.

RESULTS

Description of studies

The original searches in 2001 found 154 citations but all were excluded by the author as none of them met the inclusion criteria.

Updated searches

In February 2005, the electronic searches were re-run and the author plus a member of the Cochrane Eyes and Vision Group screened the titles and abstracts of 160 citations. Four studies were found to be relevant to this review but none fulfilled the criteria for inclusion in this review. The excluded studies are mentioned in the [Characteristics of excluded studies](#) table.

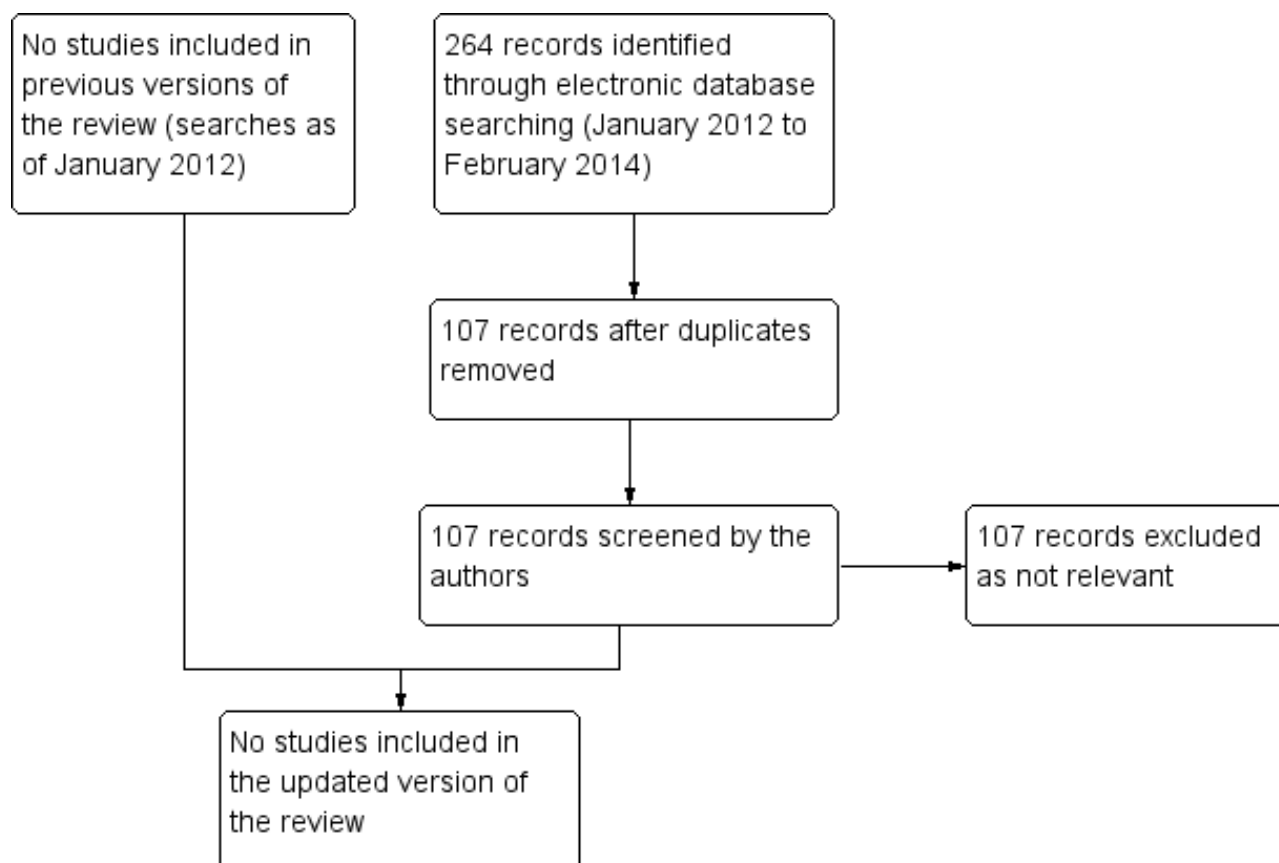
In November 2006, the electronic searches were re-run; 26 new reports of trials were identified but none met the inclusion criteria.

In November 2008, the electronic searches were updated and 23 new reports were identified. One study was found to be relevant to this review, but did not fulfill the criteria for inclusion (Ang 2008).

In January 2012, the electronic searches identified 34 citations along with eight potentially relevant ongoing or completed studies, but none met the inclusion criteria.

In February 2014, the electronic searches identified a total of 264 records (Figure 1). After de-duplication of the results we screened 107 records, however none met the inclusion criteria.

Figure 1. Results from searching for studies for inclusion in the review



Risk of bias in included studies

No studies met the criteria for inclusion in this review; therefore no assessment of quality was undertaken.

Effects of interventions

There were no studies that met the inclusion criteria for this review; therefore no narrative summary or meta-analysis was performed.

DISCUSSION

The review author has found no randomized controlled trial of interventions for asymptomatic retinal breaks and lattice degeneration to prevent retinal detachment for inclusion in this review. The most frequently cited reports demonstrated many flaws and described treatment outcomes that were not compared to an appropriate control group.

An initial review of the literature regarding prevention of retinal detachment was performed by members of the American Academy of Ophthalmology Preferred Practice Pattern Retina Panel (AAO 2003). An electronic review of MEDLINE articles and a manual review of references from relevant textbooks was performed. Each article was assigned a 'level' relevant to the strength of evidence. Level I indicated a properly conducted, well-designed randomized controlled trial (or meta-analysis of these). Level II included evidence from well-designed controlled trials without randomization, cohort or case-control analytic studies, or multiple time series with or without the intervention. Level III included

evidence from descriptive studies, case reports and consensus reports of expert committees.

In the previous review process (AAO 1998), one retrospective analysis (Folk 1989) had been considered to constitute Level II evidence. However, in the more recent review (AAO 2003), these data were considered to provide insufficient evidence to guide management. This study evaluated a large number of eyes in which lattice degeneration was present in the fellow eye of people with a retinal detachment associated with lattice degeneration in the first eye. Although treated eyes were compared to a control series, the method of allocation to treatment or observation was unclear, and a treatment benefit in eyes at highest risk was not demonstrated.

Most reports regarding prophylactic therapy have discussed treatment of lesions believed to be associated with an increased risk of retinal tears and detachments. Although there are well-established risk factors associated with the development of retinal detachment, evidence of a benefit of prophylactic therapy in eyes without symptoms is lacking, and the risk of retinal detachment appears to persist in spite of preventive treatment.

The primary limitation of prophylactic therapy is related to the fact that most retinal detachments are due to retinal tears that develop in areas of the retina that appear normal prior to vitreous detachment (Byer 1992; Chauhan 2006). Thus treatment of visible lesions associated with retinal detachment may prevent a tear at those sites, but not a tear in normal appearing retina.

A major flaw in the vast majority of reports discussing prophylactic therapy was an absence of a discussion of the state of the vitreous gel before treatment. A prospective natural course trial of aphakic fellow eyes of patients who had had a prior retinal detachment in their first eye demonstrated that eyes without a posterior vitreous detachment had a tenfold higher chance of experiencing a later retinal detachment than did eyes in which a posterior vitreous detachment was present at the onset of the observation (Hovland 1978). No known prospective or retrospective non-controlled treatment trials to date have been stratified for the presence or absence of a posterior vitreous detachment.

AUTHORS' CONCLUSIONS

Implications for practice

There are no randomized controlled trials to support conclusions regarding the value of treating asymptomatic retinal breaks to prevent retinal detachment. A meaningful study likely would require long follow-up of a large number of treated and untreated patients with similar clinical characteristics because the expected rate of retinal detachment in both groups is low. Even in patients in which a detachment in the other eye has occurred, the rate of detachment in the untreated eyes may be less than 10% over five to seven years. Such a study would be both difficult and expensive.

Implications for research

Prospective randomized trials of treatment for eyes with a relatively high risk of later detachment should offer the best opportunity

to provide outcome data that are statistically meaningful. High-risk cases may include highly myopic fellow eyes with lattice degeneration and no posterior vitreous detachment, which are also pseudophakic or scheduled for cataract surgery. Such a prospective trial of treatment versus observation should include appropriate numbers of participants observed over a sufficiently long follow-up period to ensure that the questions regarding outcomes of therapy versus no therapy are answered in a satisfactory statistical fashion.

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REFERENCES

References to studies excluded from this review

Ang 2008 {published data only}

Ang A, Poulson AV, Goodburn SF, Richards AJ, Scott JD, Snead MP. Retinal detachment and prophylaxis in type 1 Stickler syndrome. *Ophthalmology* 2008;**115**(1):164-8.

Avitabile 2004 {published data only}

Avitabile T, Bonfiglio V, Reibaldi M, Torrisi B, Reibaldi A. Prophylactic treatment of the fellow eye of patients with retinal detachment: A retrospective study. *Graefes Archive for Clinical and Experimental Ophthalmology* 2004;**242**(3):191-6.

Isola 2001 {published data only}

Isola V, Spinelli G, Misefari W. Transpupillary retinopexy of chorioretinal lesions predisposing to retinal detachment with the use of diode (810 nm) microlaser. *Retina* 2001;**21**(5):453-9.

Saracco 1980 {published data only}

Saracco JB, Estachy GM, Gastaud P, Maynard I. Prophylactic treatment of aphakic retinal detachment by argon laser photocoagulation. Study on 600 cases. *Ophthalmologica* 1980;**181**(3-4):142-8.

Wolfensberger 2003 {published data only}

Wolfensberger TJ, Aylward GW, Leaver PK. Prophylactic 360 degrees cryotherapy in fellow eyes of patients with spontaneous giant retinal tears. *Ophthalmology* 2003;**110**(6):1175-7.

Additional references

AAO 1998

American Academy of Ophthalmology. Preferred Practice Patterns: Management of posterior vitreous detachment, retinal breaks and lattice degeneration. San Francisco: American Academy of Ophthalmology, 1998.

AAO 2003

American Academy of Ophthalmology. Preferred Practice Patterns: Management of posterior vitreous detachment, retinal breaks, and lattice degeneration. San Francisco: American Academy of Ophthalmology, 2003:1-20.

Byer 1989

Byer NE. Long-term natural history of lattice degeneration of the retina. *Ophthalmology* 1989;**96**(9):1396-401.

Byer 1992

Byer NE. Rethinking prophylactic therapy of retinal detachment. In: Stirpe M editor(s). *Advances in Vitreoretinal Surgery*. New York: Ophthalmic Communications Society, 1992:399-411.

Byer 1998

Byer NE. What happens to untreated asymptomatic retinal breaks, and are they affected by posterior vitreous detachment?. *Ophthalmology* 1998;**105**(6):1045-9.

Chauhan 2006

Chauhan DS, Downie JA, Eckstein M, Aylward GW. Failure of prophylactic retinopexy in fellow eyes without a posterior vitreous detachment. *Archives of Ophthalmology* 2006;**124**(7):968-71.

EDCSG 1993

Anonymous. Risk factors for idiopathic rhegmatogenous retinal detachment. The Eye Disease Case-Control Study Group. *American Journal of Epidemiology* 1993;**137**(7):749-57.

Folk 1989

Folk JC, Arrindell EL, Klugman MR. The fellow eye of patients with phakic lattice retinal detachment. *Ophthalmology* 1989;**96**(1):72-9.

Glanville 2006

Glanville JM, Lefebvre C, Miles JN, Camosso-Stefinovic J. How to identify randomized controlled trials in MEDLINE: ten years on. *Journal of the Medical Library Association* 2006;**94**(2):130-6.

Haimann 1982

Haimann MH, Burton TC, Brown CK. Epidemiology of retinal detachment. *Archives of Ophthalmology* 1982;**100**(2):289-92.

Higgins 2011

Higgins JPT, Altman DG, Sterne JAC (editors). Chapter 8: Assessing risk of bias in included studies. In: Higgins JPT, Green S (editors). *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. Available from www.cochrane-handbook.org.

Hovland 1978

Hovland KR. Vitreous findings in fellow eyes of aphakic retinal detachment. *American Journal of Ophthalmology* 1978;**86**(3):350-3.

Ramchand 2010

Ramchand K, Hatef E, Sena DF, Fallano KA, Do DV. Pneumatic retinopexy versus scleral buckle for repairing simple rhegmatogenous retinal detachments. *Cochrane Database of Systematic Reviews* 2010, Issue 2. [DOI: [10.1002/14651858.CD008350](https://doi.org/10.1002/14651858.CD008350)]

RevMan 2012 [Computer program]

The Nordic Cochrane Centre, The Cochrane Collaboration. Review Manager (RevMan). 5.2. Copenhagen: The Nordic Cochrane Centre, The Cochrane Collaboration, 2012.

Rowe 1999

Rowe JA, Erie JC, Baratz KH, Hodge DO, Gray DT, Butterfield L, et al. Retinal detachment in Olmsted County, Minnesota, 1976 through 1995. *Ophthalmology* 1999;**106**(1):154-9.

Tielsch 1996

Tielsch JM, Legro MW, Cassard SD, Schein OD, Javitt JC, Singer AE, et al. Risk factors for retinal detachment after

cataract surgery. A population-based case-control study. *Ophthalmology* 1996;**103**(10):1537-45.

Wilkes 1982

Wilkes SR, Beard CM, Kurland LT, Robertson DM, O'Fallon WM. The incidence of retinal detachment in Rochester, Minnesota, 1970-1978. *American Journal of Ophthalmology* 1982;**94**(5):670-3.

Wilkinson 1997

Wilkinson CP, Rice TA. Michels Retinal Detachment. St Louis: Mosby-Year Book, 1997.

Znaor 2012

Znaor L, Medic A, Marin J, Binder S, Lukic I, George J. Pars plana vitrectomy versus scleral buckle for repairing simple rhegmatogenous retinal detachments. *Cochrane Database of Systematic Reviews* 2012, Issue 1. [DOI: [10.1002/14651858.CD009562](https://doi.org/10.1002/14651858.CD009562)]

References to other published versions of this review

Wilkinson 1999

Wilkinson CP. Evidence-based medicine regarding the prevention of retinal detachment. *Transactions of the American Ophthalmological Society* 1999;**97**:397-404.

Wilkinson 2000

Wilkinson CP. Evidence-based analysis of prophylactic treatment of asymptomatic retinal breaks and lattice degeneration. *Ophthalmology* 2000;**107**(1):12-5.

Wilkinson 2001

Wilkinson C. Interventions for asymptomatic retinal breaks and lattice degeneration for preventing retinal detachment. *Cochrane Database of Systematic Reviews* 2001, Issue 3. [DOI: [10.1002/14651858.CD003170](https://doi.org/10.1002/14651858.CD003170)]

Wilkinson 2005

Wilkinson CP. Interventions for asymptomatic retinal breaks and lattice degeneration for preventing retinal detachment. *Cochrane Database of Systematic Reviews* 2005, Issue 1. [DOI: [10.1002/14651858.CD003170.pub2](https://doi.org/10.1002/14651858.CD003170.pub2)]

Wilkinson 2006

Wilkinson CP. Prevention of retinal detachment. In: Wilkinson CP, Wiedemann P, Ryan SJ editor(s). *Retina*. 5th Edition. Vol. 3, Elsevier Saunders, 2013:1793-1806.

Wilkinson 2012

Wilkinson CP. Interventions for asymptomatic retinal breaks and lattice degeneration for preventing retinal detachment. *Cochrane Database of Systematic Reviews* 2012, Issue 3. [DOI: [10.1002/14651858.CD003170.pub3](https://doi.org/10.1002/14651858.CD003170.pub3)]

CHARACTERISTICS OF STUDIES

Characteristics of excluded studies [ordered by study ID]

Study	Reason for exclusion
Ang 2008	Not a randomized controlled trial
Avitabile 2004	Compared intervention group with historical controls
Isola 2001	No control group
Saracco 1980	No control group
Wolfensberger 2003	No control group

APPENDICES

Appendix 1. CENTRAL search strategy

#1 MeSH descriptor: [Retinal Detachment] explode all trees
 #2 MeSH descriptor: [Retinal Perforations] explode all trees
 #3 MeSH descriptor: [Vitreous Detachment] explode all trees
 #4 (retina* near/3 (detach* or break* or perforat* or tear* or hole*))
 #5 vitreoretinal near/3 degenerat*
 #6 vitreo retinal near/3 degenerat*
 #7 lattice near/3 degenerat*
 #8 vitreo* near/3 detach* near/3 posterior

```
#9 {or #1-#8}
#10 MeSH descriptor: [Light Coagulation] explode all trees
#11 MeSH descriptor: [Cryotherapy] explode all trees
#12 (coagulat* near/3 (light or lasers))
#13 laser* near/3 photocoagulat*
#14 laser* near/3 photo coagulat*
#15 cryotherap*
#16 {or #10-#15}
#17 prophyla*
#18 prevent*
#19 {or #17-#18}
#20 #9 and #16 and #19
```

Appendix 2. MEDLINE (OvidSP) search strategy

```
1. Randomized Controlled Trial.pt.
2. Controlled Clinical Trial.pt.
3. (randomized or randomised).ab,ti.
4. placebo.ab,ti.
5. drug therapy.fs.
6. randomly.ab,ti.
7. trial.ab,ti.
8. groups.ab,ti.
9. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
10. exp animals/ not humans.sh.
11. 9 not 10
12. exp retinal detachment/
13. exp retinal perforations/
14. exp vitreous detachment/
15. (retina$ adj3 (detach$ or break$ or perforat$ or tear$ or hole$)).tw.
16. (vitreoretinal adj3 degenerat$).tw.
17. (vitreo retinal adj3 degenerat$).tw.
18. (lattice adj3 degenerat$).tw.
19. (vitreo$ adj3 detach$ adj3 posterior).tw.
20. or/12-19
21. exp light coagulation/
22. exp cryotherapy/
23. (coagulat$ adj3 (light or laser$)).tw.
24. (laser$ adj3 photocoagulat$).tw.
25. (laser$ adj3 photo coagulat$).tw.
26. cryotherap$.tw.
27. or/21-26
28. prophyla$.tw.
29. prevent$.tw.
30. or/28-29
31. 20 and 27 and 30
32. 11 and 31
```

The search filter for trials at the beginning of the MEDLINE strategy was from the published paper by Glanville et al ([Glanville 2006](#)).

Appendix 3. EMBASE.com search strategy

```
#1 'randomized controlled trial'/exp
#2 'randomization'/exp
#3 'double blind procedure'/exp
#4 'single blind procedure'/exp
#5 random*:ab,ti
#6 #1 OR #2 OR #3 OR #4 OR #5
#7 'animal'/exp OR 'animal experiment'/exp
#8 'human'/exp
#9 #7 AND #8
#10 #7 NOT #9
#11 #6 NOT #10
```

```
#12 'clinical trial'/exp
#13 (clin* NEAR/3 trial*):ab,ti
#14 ((singl* OR doubl* OR trebl* OR tripl*) NEAR/3 (blind* OR mask*)):ab,ti
#15 'placebo'/exp
#16 placebo*:ab,ti
#17 random*:ab,ti
#18 'experimental design'/exp
#19 'crossover procedure'/exp
#20 'control group'/exp
#21 'latin square design'/exp
#22 #12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21
#23 #22 NOT #10
#24 #23 NOT #11
#25 'comparative study'/exp
#26 'evaluation'/exp
#27 'prospective study'/exp
#28 control*:ab,ti OR prospectiv*:ab,ti OR volunteer*:ab,ti
#29 #25 OR #26 OR #27 OR #28
#30 #29 NOT #10
#31 #30 NOT (#11 OR #23)
#32 #11 OR #24 OR #31
#33 'retina detachment'/exp
#34 'vitreoretinal degeneration'/exp
#35 (retina* NEAR/3 (detach* OR break* OR perforat* OR tear* OR hole*)):ab,ti
#36 (vitreoretinal NEAR/3 degenerat*):ab,ti
#37 ('vitreo retinal' NEAR/3 degenerat*):ab,ti
#38 (lattice NEAR/3 degenerat*):ab,ti
#39 #33 OR #34 OR #35 OR #36 OR #37 OR #38
#40 'laser coagulation'/exp
#41 'cryotherapy'/exp
#42 (coagulat* NEAR/3 (light OR laser*)):ab,ti
#43 (laser* NEAR/3 photocoagulat*):ab,ti OR (laser*:ab,ti AND (photo NEXT/1 coagulat*):ab,ti)
#44 cryotherap*:ab,ti
#45 #40 OR #41 OR #42 OR #43 OR #44
#46 'prophylaxis'/exp
#47 prophyla*:ab,ti
#48 prevent*:ab,ti
#49 #46 OR #47 OR #48
#50 #39 AND #45 AND #49
#51 #32 AND #50
```

Appendix 4. PubMed search strategy

1. ((randomized controlled trial[pt]) OR (controlled clinical trial[pt]) OR (randomised[tiab] OR randomized[tiab]) OR (placebo[tiab]) OR (drug therapy[sh]) OR (randomly[tiab]) OR (trial[tiab]) OR (groups[tiab])) NOT (animals[mh] NOT humans[mh])
2. (retina*[tw] AND (detach*[tw] OR break*[tw] OR perforat*[tw] OR tear*[tw] OR hole*[tw])) NOT Medline[sb]
3. (vitreoretinal[tw] AND degenerat*[tw]) NOT Medline[sb]
4. (vitreo retinal[tw] AND degenerat*[tw]) NOT Medline[sb]
5. (lattice[tw] AND degenerat*[tw]) NOT Medline[sb]
6. (vitreo*[tw] AND detach*[tw] AND posterior[tw]) NOT Medline[sb]
7. #2 OR #3 OR #4 OR #5 OR #6
8. (coagulat*[tw] AND (light[tw] OR laser*[tw])) NOT Medline[sb]
9. (laser*[tw] AND photocoagulat*[tw]) NOT Medline[sb]
10. (laser*[tw] AND photo coagulat*[tw]) NOT Medline[sb]
11. cryotherap*[tw] NOT Medline[sb]
12. #8 OR #9 OR #10 OR #11
13. prophyla*[tw] NOT Medline[sb]
14. prevent*[tw] NOT Medline[sb]
15. #13 OR #14
16. #7 AND #12 AND #15
17. #1 AND #16

Appendix 5. metaRegister of Controlled Trials search strategy

(prevention or prophylaxis or prophylatic) and retinal detachment

Appendix 6. ClinicalTrials.gov search strategy

(Prevention OR Prophylaxis OR Prophylatic) AND Retinal Detachment

Appendix 7. ICTRP search strategy

Prevention AND Retinal Detachment OR Prophylaxis AND Retinal Detachment OR Prophylatic AND Retinal Detachment

WHAT'S NEW

Date	Event	Description
26 August 2014	New search has been performed	Issue 9, 2014: Electronic searches were updated.
26 August 2014	New citation required but conclusions have not changed	Issue 9, 2014: No new trials were identified.

HISTORY

Review first published: Issue 3, 2001

Date	Event	Description
6 February 2012	New citation required but conclusions have not changed	Issue 3, 2012: No new trials were identified for inclusion in the review.
6 February 2012	New search has been performed	Issue 3, 2012: Electronic searches were updated.
5 March 2009	New search has been performed	Issue 3 2009: update searches yielded no new trials.
15 October 2008	Amended	Converted to new review format.
28 October 2004	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Charles P. Wilkinson (CPW) screened the search results, graded selected trials and wrote the review. CPW is the guarantor for the review. The Cochrane Eyes and Vision Group (CEVG) editorial team developed the search strategies and undertook the electronic searches. The CEVG also provided methodological support, including review of titles/abstracts, and assessment of full-text records of potentially included studies, etc.

DECLARATIONS OF INTEREST

None known.

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DIFFERENCES BETWEEN PROTOCOL AND REVIEW

The Methods section of this version of the review was updated to reflect the reporting and conduct standards for Cochrane reviews. Many methods planned for this review (e.g., data extraction, risk of bias assessment, meta-analysis) were not conducted because the review identified no eligible studies.

INDEX TERMS**Medical Subject Headings (MeSH)**

Retinal Degeneration [*therapy]; Retinal Detachment [*prevention & control]; Retinal Perforations [*therapy]

MeSH check words

Humans